FINAL RESUME ON THE RESEARCH UNIT:
Toulouse NeuroImaging Center (ToNIC)

UNDER THE SUPERVISION OF THE FOLLOWING INSTITUTIONS AND RESEARCH BODIES:
Institut national de la santé et de la recherche médicale – Inserm
Université Toulouse 3 - Paul Sabatier - UPS

EVALUATION CAMPAIGN 2019-2020
GROUP A

Report published on April, 03 2020
In the name of Hcéres¹:

Nelly Dupin, Interim President

In the name of the experts committee²:

Bogdan Draganski, Chairman of the committee

Under the decree No.2014-1365 dated 14 November 2014,

¹ The president of Hcéres “countersigns the evaluation reports set up by the experts committees and signed by their chairman.” (Article 8, paragraph 5);

² The evaluation reports “are signed by the chairman of the experts committee”. (Article 11, paragraph 2).
Tables in this document were filled with data submitted by the supervising body on behalf the unit.

UNIT PRESENTATION

Unit name: Toulouse NeuroImaging Center
Unit acronym: ToNIC
Current label and N°: UMR 1214
ID RNSR: 200716480M
Application type: Restructuration
Head of the unit (2019-2020): Mr Pierre PAYOUX
Project leader (2021-2025): Mr Pierre PAYOUX
Number of teams and/or themes: 3

EXPERTS COMMITTEE MEMBERS

Chair: Mr Bogdan DRAGANSKI, CHUV, Switzerland
Experts:
- Ms Elise BANNIER, CHU Rennes (supporting personnel)
- Mr Serge GOLDMAN, Université libre de Bruxelles, Belgium
- Mr Gilles KARCHER, CHU de Nancy (representative of CNU)
- Mr Didier LETOURNEUR, CNRS Paris (representative of Inserm CSS)
- Mr Éric SALMON, Université de Liège, Belgium

HCÉRES REPRESENTATIVE

Ms Céline SOUCHAY

REPRESENTATIVES OF SUPERVISING INSTITUTIONS AND BODIES

- Ms Armelle BARELLI, Inserm
- Ms Christelle GUEGAN, Inserm
- Ms Marie-Josèphe LEROY-ZAMIA, ITMO technologies de la santé Inserm
- Mr Alexis VALENTIN, Université Paul Sabatier, Toulouse
INTRODUCTION

HISTORY AND GEOGRAPHICAL LOCATION OF THE UNIT

The Toulouse NeuroImaging Centre (ToNIC), located at the Purpan University Hospital, exists since the early 1980ies thanks to funding as research unit (U230, U455, U825, U1214) by Inserm/University Toulouse 3 Paul Sabatier (UPS). In its current location since 2011, ToNIC has 1200m² laboratory space in close proximity to research-dedicated equipment. ToNIC has strong focus on translational neuroscience with clinical relevance supported by brain imaging infrastructure including SPECT, later replaced by PET and MRI scanners. Currently, ToNIC is confined to two research teams – Development and Validation of biomarkers in MRI and Nuclear medicine (DEVIN) and Therapeutic Innovation in cerebrovascular disease (IDREAM), a third one – 3D CHIP will join beginning 2021.

There are strong links to clinical research and technical platforms in the next geographic proximity – CREFRE small animal MRI platform (UMS 06, Oncopole site, Toulouse), the sports medicine activity in Rodez, an EEG lab, a TMS lab with a neuro-navigation system, wet-labs (classical and L2 at the Toulouse University Hospital, at the Rangueil Hospital). ToNIC benefits from access to a Movement laboratory as well as to the primate housing facilities (CERCO, UMR CNRS/UPS). ToNIC has also an own L2 wet-laboratory since 2013. The PET facility is in line with the iRON labex additionally taking part in a P1-P2 programme for development of a fluorination platform.

MANAGEMENT TEAM

ToNIC is directed by Pierre Payoux.

HCÉRES NOMENCLATURE

SVE 4 – Neurosciences.

THEMATICS

ToNIC’s main topic is neuroscience – spanning the broad spectrum of basic and clinical research, between brain health and disease in both animal models and humans. Among the clinical topics the researchers tackle pathophysiological and treatment related questions in neurodegeneration (e.g. Parkinson’s disease, Alzheimer’s disease), recovery of lost function after brain injury, to name but a few. Given the methodological orientation of ToNIC, there are a number of developments across a panoply of techniques from non-invasive brain imaging to investigations at cellular level, that support ongoing research activities and stimulate new scientific projects. There is a new avenue of research in 3D bioprinting associated with the integration of 3D CHIP team of Pierre Layrolle.

UNIT WORKFORCE

<table>
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<th>Toulouse NeuroImaging Center, ToNIC</th>
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<th>Number 06/30/2019</th>
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<td>Full professors and similar positions</td>
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GLOBAL ASSESSMENT OF THE UNIT

Since its creation, ToNIC has kept the profile of a truly translational unit in the field of paroxysmal and chronic brain disorders aiming at improving diagnosis, treatment and prediction of clinical outcome. The geographical proximity to the University hospital and the strong involvement of clinicians in all aspects of ToNIC’s activities ensure the clinical relevance of research. The existing infrastructure with sufficient laboratory space including a wet-laboratory, fully research-dedicated 3T MRI (with European ISO label) and PET with a fluorination platform and most importantly, the direct access to patients with brain disorders creates a unique ecosystem for thriving inter-disciplinary neuroscience research. ToNIC’s Principal Investigators are adequately represented at the faculty level at the University hospital and leadership of the Clinical Investigation Centre, likewise in local academic consortia – Fédération Hospitalo-Universitaire HoPes between CHU Toulouse, Université Toulouse 3 and the ITMO Aviesan and the INSPIRE programme “Gerontopole” at the Toulouse University hospital.

ToNIC’s scientific output is at level comparable with similar units across Europe, the amount of acquired funding mainly through clinical trials is impressive. The unit’s key achievements during this evaluation period – the creation of the Pi-R2 radiopharmacology platform for cold radiochemistry, the validation of in vivo and ex vivo data acquisition and analysis strategy for animal models of brain disorders coupled with sophisticated analysis using Artificial Intelligence methods have opened new opportunities for expansion as evident from projects in psychiatry with depressed patients and in disorders of consciousness.

ToNICs researchers have received prices and are members of national and international basic and clinical neuroscience societies. ToNIC’s in-house created software solutions (EvoLex, CORTHIZON, COMAPREDICTION) are well accepted in the broader scientific community.

The planned integration of the 3D CHIP project for bioprinting of organs on chip is a strategic decision that goes beyond the trodden path of established scientific collaborations. It carries a great potential, but at the same time – a risk for difficulties at various implementational and production levels.

Overall, ToNIC’s achievements in all relevant fields – research, teaching and funding is at international level. The work of ToNICs members is highly regarded, which is recognized by the relevant basic and clinical research domains.
The evaluation reports of Hcères are available online: www.hceres.com

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